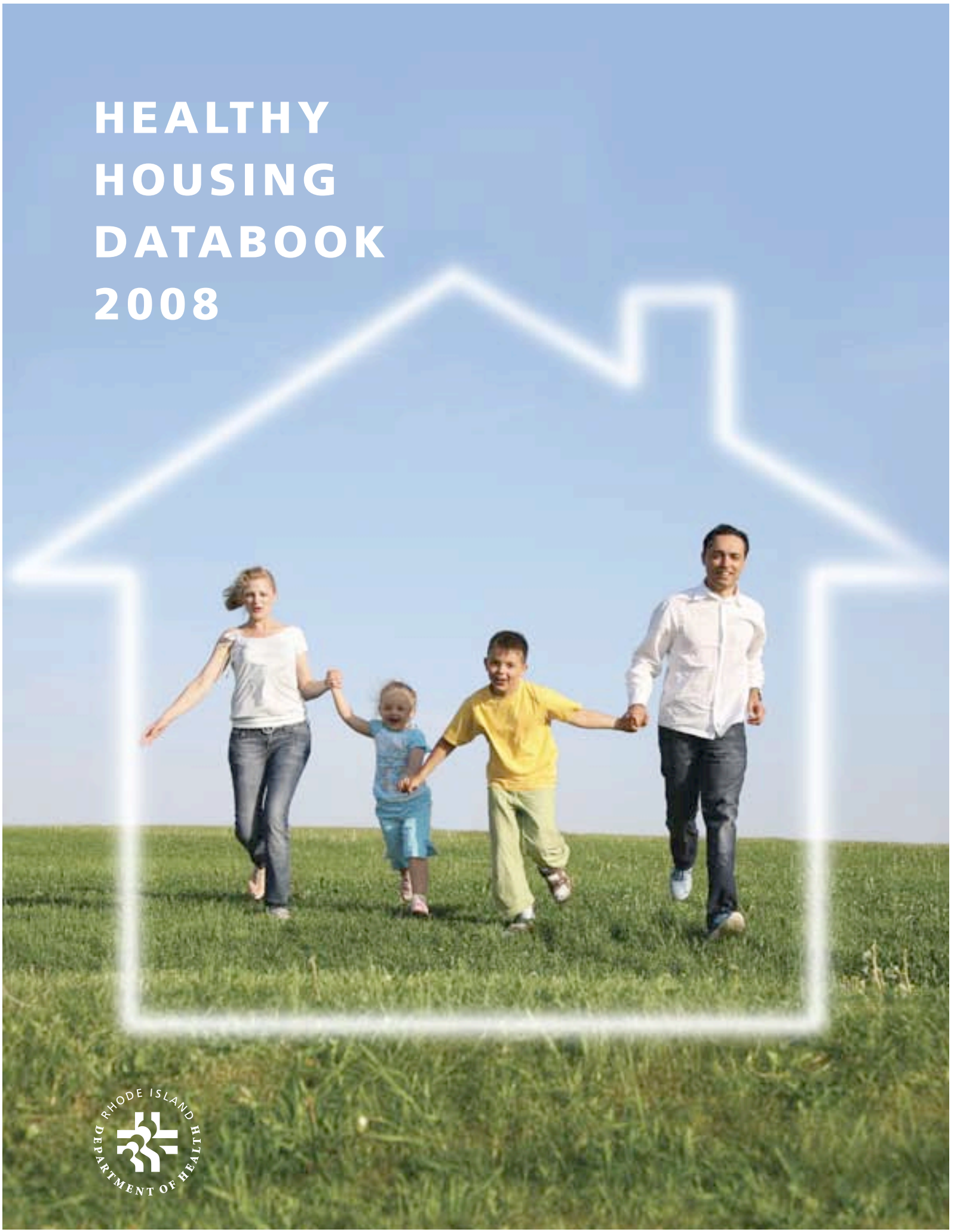
HEALTHY HOUSING DATABOOK 2008



RHODE ISLAND DEPARTMENT OF HEALTH

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LETTER FROM THE DIRECTOR

Dear Colleague:

As you may know, the association between health and housing is not a new concept. While a healthy house promotes well being, unhealthy housing can lead to poor health outcomes, such as asthma, lead poisoning, injuries, burns, respiratory infections, cancer, food insecurity and impacts on the neurological development of children that lead to decreased intellectual capacity.

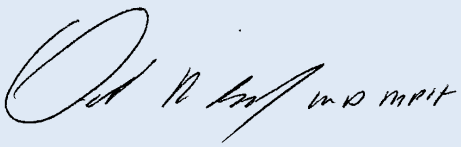
We at the Rhode Island Department of Health are developing healthy housing policies and interventions to protect the health of Rhode Islanders. Our efforts and policies aim to prevent exposures to environmental hazards in the home, such as lead, radon, and carbon monoxide, which took the lives of three Rhode Islanders in January 2008. But we cannot address all healthy housing concerns alone.

With this in mind, we are pleased to present to you this first Healthy Housing report, designed to inform you about the health impact of environmental hazards in our communities, and to illustrate how our state data compare to the national data. This report should also inform policy makers about the programs and resources available at the Department of Health for some of those environmental concerns.

Most importantly, we are inviting you to partner with us in this important work. Please join the Department of Health's Healthy Housing Collaborative, by contacting our Steering Committee. The Collaborative was developed to initiate genuine partnerships to help move communities towards a more comprehensive approach to healthy housing practices.

Thank you for your continuous support in promoting healthy environments for healthier children and families in Rhode Island. We look forward to new and continued collaboration as we strive to achieve a healthier Rhode Island!

Sincerely,



David R. Gifford, MD, MPH
Director, Rhode Island Department of Health

INTRODUCTION

"The connection between health and dwelling is one of the most important that exists."
— Florence Nightingale

The association between health and housing has been known for centuries. Public health practitioners in the 1800s discovered and explored the association between sanitation and disease. This knowledge led to improved sanitation in an effort to control diseases such as typhus and cholera. With the advent of effective medical treatments for these diseases, medical care providers shifted their focus to purely medical solutions for the health problems affecting their patients. Although advances in medical care have improved the health of many, it is important that exposures in the patient's home be considered during diagnosis and treatment. For conditions like childhood lead poisoning, where the major source of exposure is chipping and peeling lead based paint, consideration of the home is essential to the medical care of the child. For other problems, such as asthma, there is increasing recognition of the role environmental factors may have in the growing incidence and management of this disease.

Since the 1800s, numerous individuals and organizations have studied the concept of healthy housing, and have researched the impact of the housing environment on the health outcomes of its occupants. In recent years, healthy housing has come to the forefront of public health.

At the Fourth Ministerial Conference on Environment and Health in Budapest, Hungary in June 2004, 250 decision makers and scientists from 24 countries agreed to the following Declaration: "We are therefore committed, within the limits of our national mandates, to taking action to ensure that health and environmental dimensions are placed at the core of all housing policies (from housing construction and rehabilitation plans, programs and policies to the use of adequate building materials) and that healthy conditions are ensured and maintained in the existing housing stock. We commit ourselves to contributing to the development and strengthening of housing policies that address the specific needs of the poor and the disadvantaged, especially regarding children."

In our efforts to work toward healthy housing, it is important to understand the scope of healthy housing. The National Center for Healthy Housing (NCHH) defines healthy housing as housing that is "designed, constructed, maintained, or rehabilitated in a manner that supports the health of residents." The National Center for Healthy Housing has also defined seven principles that are fundamental to achieving a healthy home:

- Keep it Dry
- Keep it Clean
- Keep it Pest Free
- Keep it Ventilated
- Keep it Safe
- Keep it Free of Contaminants
- Keep it Well-maintained

We in Rhode Island are using the definition and the seven principles of healthy housing that were defined by NCHH.

Rhode Island's public health community is coming to consensus that healthy housing is one of the fundamental components of public health. We are concerned that "unhealthy housing," housing that does not support the health and well being of its occupants, is detrimental to Rhode Island at both the individual and population levels. At the individual level, unhealthy housing can lead to poor health outcomes such as asthma, lead poisoning, injuries, burns, respiratory infections, cancer, food insecurity, and impacts the neurological development of children that leads to decreased intellectual capacity (IQ). These poor health outcomes at the individual level lead to poor economic outcomes at the population level. The entire state of Rhode Island is impacted through increased healthcare costs to treat diseases attributable to unhealthy housing, poor school performance and missed school days among children, poor work performance and missed workdays among adults, and increased special education costs.

These concerns motivated the Rhode Island Department of Health to gather individuals from various organizations to discuss ways to strengthen the link between public health and housing policies. What began as a discussion among a dozen people in 2005, resulted in the establishment of the Healthy Housing Collaborative, which, by 2007, was composed of more than 70 members.

At the end of 2006 the Healthy Housing Collaborative agreed to the following vision for healthy housing:

"All Rhode Islanders have a right to housing that supports their growth, development, and physical and mental health, and provides the opportunity to achieve a positive quality of life throughout their entire lifespan."

The Healthy Housing Collaborative continues to convene quarterly at the Rhode Island Department of Health. Members of the Collaborative propose initiatives and form workgroups to develop healthy housing strategies. Some initiatives have already been completed; many others are long-term and are currently in process. The group will continue to formulate and prioritize efforts to promote healthy housing practices in the state, as we strive to provide all Rhode Islanders with healthy housing.

To learn more about the Healthy Housing Collaborative or to become a member, please contact one of the Healthy Housing Steering Committee members listed in Appendix B.

ABOUT THIS REPORT

The concept of healthy housing, as defined by the World Health Organization, is multi-dimensional in that it encompasses the physical, social, and mental conditions for health, safety, hygiene, comfort, and privacy for those residing in homes. Although all of these aspects of healthy housing are important, this report is limited to a few of the healthy housing concerns affecting the State.

All Rhode Islanders have a right to housing that supports their growth, development, and physical and mental health, and provides the opportunity to achieve a positive quality of life throughout their entire lifespan.

The report provides background information about hazards in the home and explains how they relate to the seven principles of healthy housing defined by the National Center for Healthy Housing (dry, clean, pest free, ventilated, safe, free of contaminants, and well-maintained). Each section also includes Rhode Island data on the health conditions caused by the hazards, and information about what the medical and housing communities as well as household occupants can do to prevent exposure to these hazards in the home. The report addresses the following household hazards:

- Asbestos
- Carbon monoxide
- Contaminated water
- Lead
- Mold
- Radon

The report also addresses asthma and unintentional injuries. Asthma is caused and exacerbated by many household hazards. Safety hazards in the home are responsible for many preventable unintentional injuries.

More information on the topics contained in this report, as well as other healthy housing concerns not included here, can be found on the following websites:

- Rhode Island Department of Health
  www.health.ri.gov
- Regional Center for Poison Control & Prevention
  www.maripoisoncenter.org
- Centers for Disease Control & Prevention (CDC)
  www.cdc.gov
- Environmental Protection Agency (EPA)
  www.epa.gov
- Housing and Urban Development (HUD)
  www.hud.gov
- National Center for Healthy Housing (NCHH)
  www.centerforhealthyhousing.org

It is our hope that this report serves as a useful tool for the medical and housing communities, as well as for household occupants. We also anticipate that this report will be a vehicle to promote collaborations with several stakeholder groups and engage other partners in our efforts to promote healthy housing and healthy communities for all Rhode Islanders.

ASBESTOS

WHAT IS ASBESTOS?

Asbestos is a naturally occurring mineral with several unique properties. It is resistant to heat, chemicals, and electricity, and it is flexible enough to be formed and woven into different shapes. Asbestos was widely used in building materials, paper products, textiles, friction products, and brake pad linings. In homes constructed prior to 1970, asbestos may be found in many materials such as exterior siding, roofing, resilient flooring, plasters, ceiling tiles, and insulation used on heating system pipes and furnaces. Although use of asbestos in commercial products has decreased substantially, it is still used in some products sold in the United States.

The best way for homeowners to prevent exposure to asbestos fibers is to assure that materials suspected of containing asbestos are maintained intact and in good condition, and are not disturbed during remodeling activities.

WHAT ARE THE HEALTH EFFECTS OF ASBESTOS?

Exposure to asbestos is a health concern when high concentrations of asbestos fibers are inhaled over an extended period of time. When asbestos fibers are inhaled, they are deposited deep into the lungs, and can cause serious diseases such as asbestosis, mesothelioma, and lung cancer. These asbestos-related diseases usually develop 20 to 40 years after exposure to asbestos fibers.

Asbestosis

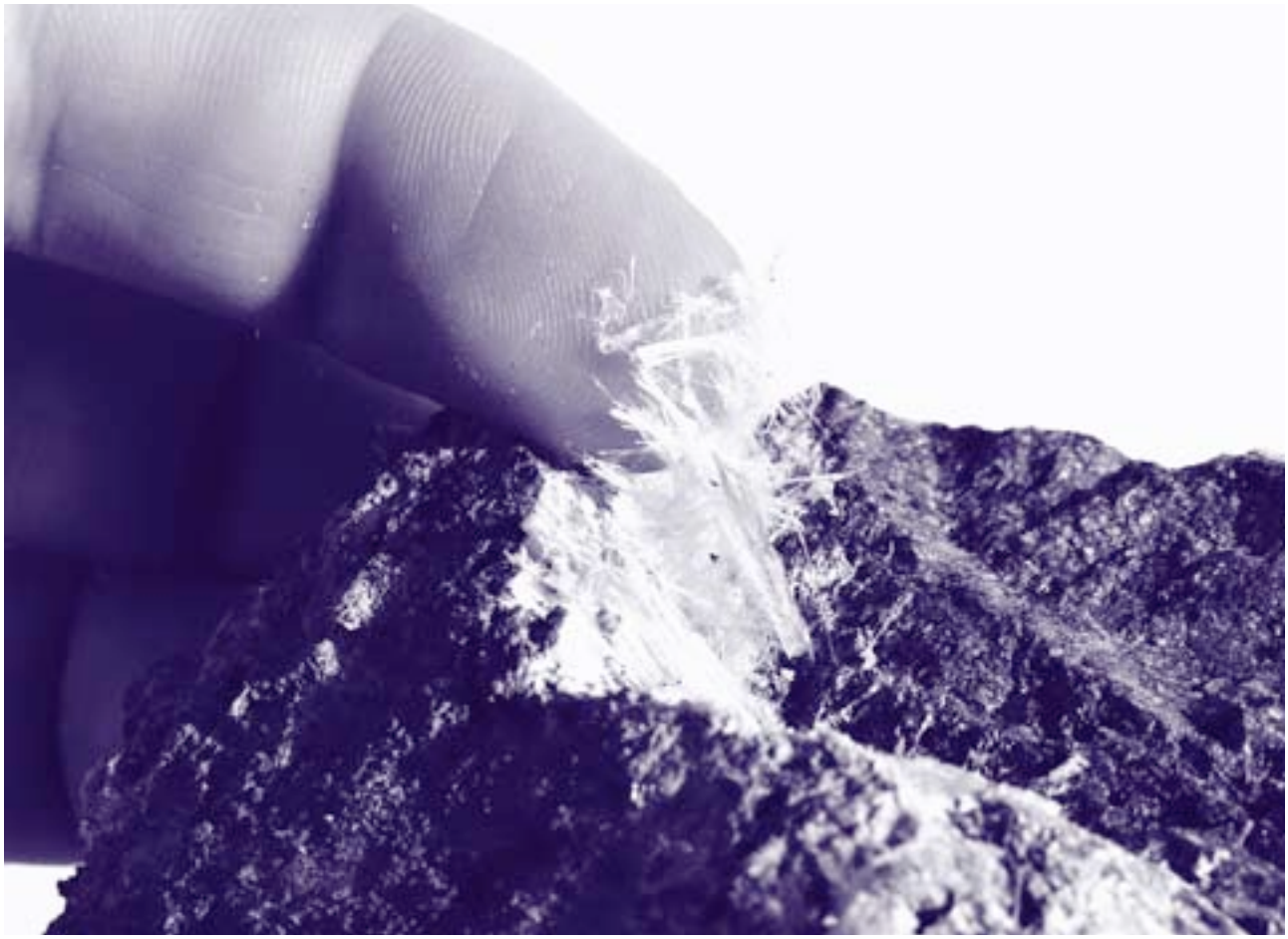
Asbestosis is the scarring of lung tissue. The result is severe respiratory impairment with a reduction in the ability of the lungs to transfer oxygen from inhaled air into the blood stream. The damage is debilitating, irreversible, and may lead to death. Asbestosis results primarily from excessive workplace exposures to asbestos, and is not associated with asbestos exposure in the home.

Mesothelioma

Mesothelioma is a cancer of the mesothelium, the protective lining that covers most of the body's internal organs. The most common site for mesothelioma is the lining of the lungs and chest cavity. It can also occur in the linings of the abdominal cavity and the heart. Mesothelioma is almost always caused by exposure to asbestos. Several studies have shown that people exposed to asbestos at work can carry the fibers home on their clothing, putting their family members at increased risk of developing mesothelioma.[1] Although mesothelioma is a relatively rare disease approximately 2,000 – 3,000 cases in the US every year[2], it is almost always fatal. It can be prevented, however, by avoiding contact with asbestos.

1 American Cancer Society, What Causes Mesothelioma? Can It Be Prevented? www.cancer.org

2 American Cancer Society, How Many People Get Mesothelioma? www.cancer.org



Lung Cancer

Exposure to asbestos can also cause lung cancer. Studies have shown that smokers who are exposed to asbestos are 50 to 90 times more likely to develop lung cancer than the general population.

In addition to the respiratory diseases described, studies have shown that ingestion of asbestos fibers may cause gastrointestinal cancers such as esophageal, stomach, and intestinal cancer. Prolonged physical contact with asbestos fibers can also cause asbestos skin warts.

HOW DOES ASBESTOS RELATE TO THE PRINCIPLES OF HEALTHY HOUSING?

Neglected asbestos is a dangerous air contaminant that can cause serious health problems. Keeping asbestos well-maintained reduces the probability that it will negatively affect the health of home occupants. The following two healthy housing principles pertain to asbestos:

- *Keep it well-maintained* – Asbestos poses a health risk when it is damaged or friable. Friable means that it can easily be reduced to powder by hand pressure. The best way to prevent exposure to asbestos fibers is to assure that materials suspected of containing asbestos are maintained intact and in good condition, and are not disturbed during remodeling activities.

- *Keep it free of contaminants* – If asbestos-containing materials become damaged or must be disturbed during renovation activities, removing, repairing, enclosing or encapsulating the asbestos can eliminate health hazards. A trained asbestos abatement contractor should be hired to do the work. The contractor will follow specific work practices to ensure the safety of himself and others in the household. When the work is finished, the contractor will assure that the area is thoroughly cleaned. It is also important to properly dispose of all asbestos waste generated.

NATIONAL AND LOCAL DATA

The maintenance and handling of asbestos containing materials is highly regulated in public and commercial buildings, particularly in schools. It is estimated that asbestos is present in nearly 700,000 public and commercial buildings throughout the United States and is in damaged condition in approximately 500,000 of those buildings.

WHAT CAN YOU DO ABOUT ASBESTOS?

Tackling the problem of asbestos requires the cooperation of multiple stakeholders. Since asbestos is not commonly used today, many people do not know about the potential risks. Making the general public aware of the contaminant and its sources is imperative. Specifically, each group of stakeholders should do the following:

Medical community

- Assess patients' risk of asbestos exposure and educate them accordingly. A patient's occupation and housing situation are key risk factors to assess.
- Inform patients that the best way to greatly reduce the risk of lung cancer if you have been exposed to asbestos is to avoid exposure to tobacco smoke.

Housing community

- Inspect all properties for asbestos containing materials.
- Institute an asbestos operations and maintenance program to ensure proper maintenance, and safe removal and handling of asbestos.
- Consider the presence of asbestos during all remodeling and renovation activities.
- Ensure that a licensed professional performs all asbestos abatement activities.

Household occupants

- Become educated on the risks of asbestos and learn to identify probable asbestos containing materials in the home.
- Learn how to maintain asbestos-containing materials. In cases where asbestos is a danger, use a licensed professional to perform abatement activities.

WEB RESOURCES

Rhode Island Department of Health – Asbestos
www.health.ri.gov/environment/occupational/asbestos

Agency for Toxic Substances and Disease Registry – Asbestos
www.atsdr.cdc.gov/asbestos

Environmental Protection Agency – Asbestos
www.epa.gov/asbestos

ASTHMA

WHAT IS ASTHMA?

Asthma is a chronic disease of the respiratory system in which the airways, or tubes that carry oxygen in and out of the lungs, occasionally become swollen, inflamed, and lined with excessive amounts of mucus. These episodes, called asthma attacks, can be triggered by a variety of things, depending on the individual, such as:

- Secondhand smoke
- Dust mites
- Cockroaches
- Rodents
- Mold
- Pet dander (e.g., from cats, dogs, and birds)
- Smoke (e.g., wood burning stove, kerosene heaters)
- Strong odors and sprays (e.g., perfumes, air fresheners, paints, cleaning solutions)
- Cold weather
- Pollen
- Exercise
- Stress
- Sulfites in foods (e.g., beer, wine, shrimp, dried fruit, processed potatoes)
- Certain medications (e.g., cold medicines, aspirin)

Asthma cannot be cured, but it can be controlled. Taking asthma medications as prescribed and avoiding asthma triggers can help a person with asthma avoid an asthma attack. Asthma that is not well managed can result in emergency room visits, hospitalizations, loss of school and workdays, and a lower quality of life.

Keeping a home free of asthma triggers can drastically reduce symptoms in people with asthma.

WHAT ARE THE HEALTH EFFECTS OF ASTHMA?

The narrowing of the airways that occurs during an asthma attack can cause wheezing, shortness of breath, chest tightness, and coughing. The severity of these symptoms can range from mild to life threatening.

HOW DOES ASTHMA RELATE TO THE PRINCIPLES OF HEALTHY HOUSING?

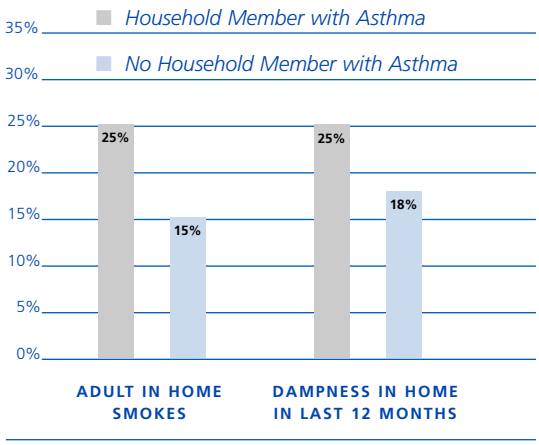
Keeping a home free of asthma triggers can drastically reduce symptoms in people with asthma. The following four principles of healthy housing pertain to asthma:

- *Keep it dry* – Keeping the home dry helps avoid asthma triggers associated with moisture problems, such as mold.
- *Keep it clean* – Keeping the home clean minimizes exposure to dust mites, cockroaches, rodents, and pet dander, common asthma triggers.
- *Keep it pest free* – Keeping the home pest free eliminates asthma triggers associated with cockroaches and rodents.
- *Keep it free of contaminants* – Keeping the home free of contaminants such as secondhand smoke and strong odors will help avoid asthma triggers.

NATIONAL AND LOCAL DATA

Many factors have been shown to increase the risk of developing asthma and of having more severe asthma once a person has the disease. One of the most important surveys for identifying the number of people living with asthma is the Behavioral Risk Factor Surveillance System (BRFSS). Results from the 2005-2006 BRFSS indicate that between 9 – 12% of Rhode Island children ages 17 and younger, and between 10 – 11% of Rhode Island adults ages 18 and older, currently have doctor-diagnosed asthma. The 2005-2006 BRFSS survey results also show that an estimated 19% of Rhode Island households have a resident who currently has asthma. Two asthma triggers were significantly more likely to be present in households where an adult and/or child currently had asthma, as compared with

PERCENT OF HOUSEHOLDS REPORTING PRESENCE OF ASTHMA TRIGGERS



Data are based on the 2005 – 2006 RI Behavioral Risk Factor Surveillance System unweighted data.

HOW ASTHMA AFFECTS THE QUALITY OF LIFE OF RHODE ISLANDERS

ADULTS
Past month
46% had an asthma attack
43% had difficulty sleeping through the night because of asthma
65% used prescribed asthma medication to prevent an asthma attack for one or more days
Past year
38% were unable to work one or more days because of asthma
17% went to an emergency room because of asthma

CHILDREN
Past month
25% missed one or more school days because of asthma

Data are based on the 2005 – 2006 RI Behavioral Risk Factor Surveillance System weighted data.

households where no one currently had asthma:

- An adult in the home smokes, and
- Water or dampness was present in the home in the past 12 months

WHAT CAN YOU DO ABOUT ASTHMA?

There are many household hazards that can trigger asthma attacks. Preventing these triggers requires that household occupants take multiple precautions. The medical community plays an important role in patient education and the housing community can help with preventive measures during the building and maintenance of property. Specifically, each group of stakeholders should do the following:

Medical community

- Assist patients in identifying asthma triggers specific to them.
- Educate patients about the importance of avoiding asthma triggers.
- Educate patients on the proper use of asthma medications and other tools (e.g., spacers, peak flow meters) to assist them in managing their asthma.
- Refer patients to agencies that can assist with housing needs.
- Ask patients not to smoke in their homes.

Housing community

- Install proper ventilation to the outside in damp areas to minimize moisture problems.
- Routinely inspect houses for sources of moisture and take steps to eliminate the source or cause.
- Install vapor barriers in crawl spaces.
- Develop a 'smoke-free' policy in multiple-unit rental properties.
- Develop a policy for proper disposal of trash and garbage to reduce pests in rental properties.

Household occupants

- Do not allow smoking in the home.
- Keep the home free of dust, mold, and other potential asthma triggers.
- Use allergen resistant mattress and pillow covers.
- Keep pets outdoors and away from sleeping areas.
- Remove carpeting.
- Keep people out of the room while vacuuming. If possible, purchase a vacuum with a high efficiency particulate air (HEPA) filter.
- Keep food and garbage in closed containers.
- Dispose of trash and garbage promptly to reduce pest problems in the home.
- Use poison baits, powders, gels, paste or traps to help eliminate cockroaches.
- Use cleaners that are not known to trigger an asthma attack.
- Install proper ventilation to the outside in damp areas to minimize moisture problems.
- Routinely inspect houses for sources of moisture and take steps to eliminate the source or cause.
- Install vapor barriers in crawl spaces.
- If possible, avoid use of wood burning stoves, kerosene heaters, fireplace, unvented gas stove or heater.
- Take all asthma medication as prescribed.

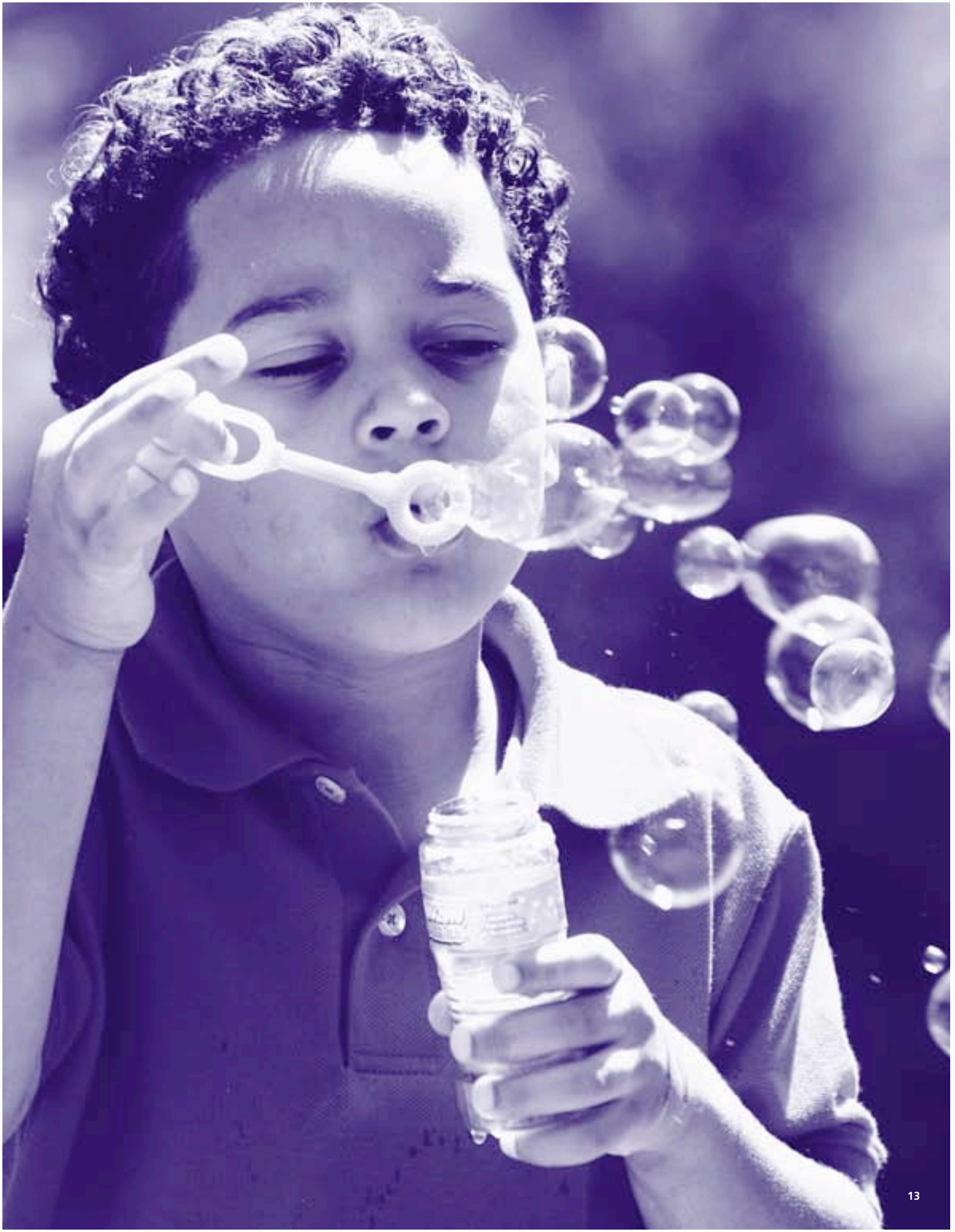
WEB RESOURCES

Rhode Island Department of Health – Asthma
www.health.ri.gov/topics/asthma.php

Centers for Disease Control and Prevention – Asthma
http://cdc.gov/asthma

Environmental Protection Agency – Asthma
http://epa.gov/asthma

Housing and Urban Development – Asthma
www.hud.gov/offices/lead/healthyhomes/asthma.cfm



CARBON MONOXIDE

WHAT IS CARBON MONOXIDE?

Carbon monoxide (CO) is a colorless, odorless, toxic gas that is produced by the incomplete combustion of gas, oil, coal and wood. Carbon monoxide is often associated with malfunctioning heating systems, blocked chimneys, and the improper use of portable gasoline-powered generators.

Education about the causes and effects of carbon monoxide are essential to prevent the unintentional effects on household occupants.

WHAT ARE THE HEALTH EFFECTS OF CARBON MONOXIDE?

The health effects of carbon monoxide exposure vary depending on the concentration in the air, the duration of the exposure, and the susceptibility of the individual. At low concentrations, carbon monoxide poisoning causes headaches, nausea, vomiting, drowsiness, and poor coordination. Most people who develop mild carbon monoxide poisoning recover quickly

when moved into fresh air. At higher concentrations, carbon monoxide poisoning causes confusion, unconsciousness, chest pain, shortness of breath, coma, and in some cases, as in the tragic incident involving three family members in Providence in January of 2008, even death. Carbon monoxide poisoning can also compound pre-existing health problems.

Healthy adults may show no ill effects when exposed to low concentrations of carbon monoxide. Vulnerable populations, however, such as children, people with asthma, older adults, or people with heart or lung problems, may show symptoms of carbon monoxide poisoning when exposed to low concentrations of CO over a long period of time.

HOW DOES CARBON MONOXIDE RELATE TO THE PRINCIPLES OF HEALTHY HOUSING?

Carbon monoxide is a relatively easy substance to control in the household. Problems arise in poorly maintained homes with inadequate ventilation systems and improperly functioning appliances. The following two principles of healthy housing pertain to carbon monoxide:

- *Keep it ventilated* – Fuel-burning appliances, such as furnaces and hot water heaters, create carbon monoxide. If these appliances are not properly vented out of the house, the carbon monoxide can build up in the home.
- *Keep it well-maintained* – If fuel-burning appliances are not installed properly, or are not working properly, they can create more carbon monoxide than normal. To minimize production of CO, it is important to keep these appliances well maintained.

NATIONAL AND LOCAL DATA

Unintentional carbon monoxide exposure accounts for approximately 15,000 emergency department visits and 500 unintentional deaths in the United States each year. Between 1999 and 2004, carbon monoxide poisoning was listed as a contributing cause of death on 16,447 death certificates in the United States. Of these, 16% (2,631) were classified as both unintentional and non fire-related deaths.[3]

Between 2005 and 2007, the Regional Center for Poison Control and Prevention received 192 calls from Rhode Island residents related to carbon monoxide. The majority of these calls (174, 90.6%) were related to carbon monoxide exposure, and the remaining calls were seeking information about carbon monoxide.

The EPA ambient air standard for carbon monoxide is 9 parts per million (ppm). The levels of carbon monoxide within a home vary greatly. Average levels of carbon monoxide in homes without gas stoves vary from 0.5 to 5 ppm. Levels near properly adjusted gas stoves are often 5 to 15 ppm and those near poorly adjusted stoves may be 30 ppm or higher.[4]

Weatherization, a program that helps low-income families improve the energy-efficiency of their homes and reduce their energy bills, tests for carbon monoxide in various locations in the home. Of the more than 900 homes in Rhode Island that received weatherization in 2006 and 2007, approximately 23% had elevated levels of carbon monoxide somewhere in the home. The most common places found to have elevated levels of carbon monoxide are near the furnace and the gas stove.

3 MMWR: Carbon Monoxide-Related Deaths- United States, 1999—2004. Dec 21, 2007 / 56(50);1309-1312.

4 Environmental Protection Agency. www.epa.gov/iaq/co.html

WHAT CAN YOU DO ABOUT CARBON MONOXIDE?

Education about the causes and effects of carbon monoxide are essential to prevent the unintentional effects on household occupants. Simultaneously, the aggressive promotion and usage of carbon monoxide detectors will go a long way towards reducing the negative effects of this poisonous gas. Specifically, the following actions should be taken by each stakeholder group.

Medical community

- Consider carbon monoxide as a potential cause when patients present with headache symptoms.
- Educate all patients about the dangers of carbon monoxide and the importance of having a CO detector.
- Report cases to the Rhode Island Department of Health.

Housing community

- Install carbon monoxide detectors when building new houses or preparing a house to be rented.
- Consistently check houses to ensure that fuel-burning appliances are installed and vented properly.
- Educate homeowners and renters about the dangers of carbon monoxide and the importance of having a CO detector.

Household occupants

- Become educated about the risks of exposure to carbon monoxide.
- Use an approved CO detector with an audible alarm inside the home.
- Have furnaces and fireplaces cleaned and inspected before each heating season; have other fuel-burning appliances checked regularly.
- Use kerosene space heaters only in well-ventilated areas.
- Never start or idle gas lawn mowers, cars, trucks, or other vehicles in an enclosed area, such as a garage, even with the doors open.
- Vent fuel-burning appliances outside whenever possible.
- Never use a charcoal grill inside the home or garage.
- Read and follow manufacturer instructions and precautions that come with any fuel-burning device.
- Never use a gas oven for heat inside the home.

WEB RESOURCES

Rhode Island Department of Health – Carbon Monoxide
www.health.ri.gov/topics/carbonmonoxide.php

Centers for Disease Control and Prevention – Carbon Monoxide, www.cdc.gov/co

Environmental Protection Agency – Carbon Monoxide, www.epa.gov/air/urbanair/co/index.html

Housing and Urban Development – Carbon Monoxide
www.hud.gov/offices/lead/healthyhomes/carbonmonoxide.cfm

Regional Center for Poison Control and Prevention
www.maripoisoncenter.org

CONTAMINATED DRINKING WATER

WHAT IS CONTAMINATED DRINKING WATER?

Contaminated drinking water is water that does not meet certain guidelines and is not considered safe and healthy to drink. High quality drinking water is essential to good health. Contamination of public or private drinking water supplies can result from naturally occurring conditions and/or manmade circumstances.

Important aspects of maintaining high quality drinking water involve protecting the source of water, treating it as necessary, delivering it through a well-maintained distribution system, and verifying the quality of the water through routine testing.

Important aspects of maintaining high quality drinking water involve protecting the source of water, treating it as necessary, delivering it through a well-maintained distribution system, and verifying the quality of the water through routine testing.

While most drinking water is tested at the source, the testing for lead, bacteria, and disinfection by-products are conducted at locations throughout the community. If there is a problem with the quality of the public drinking water, the supplier is required to notify the public. Owners of homes with private wells are responsible for testing their own water.

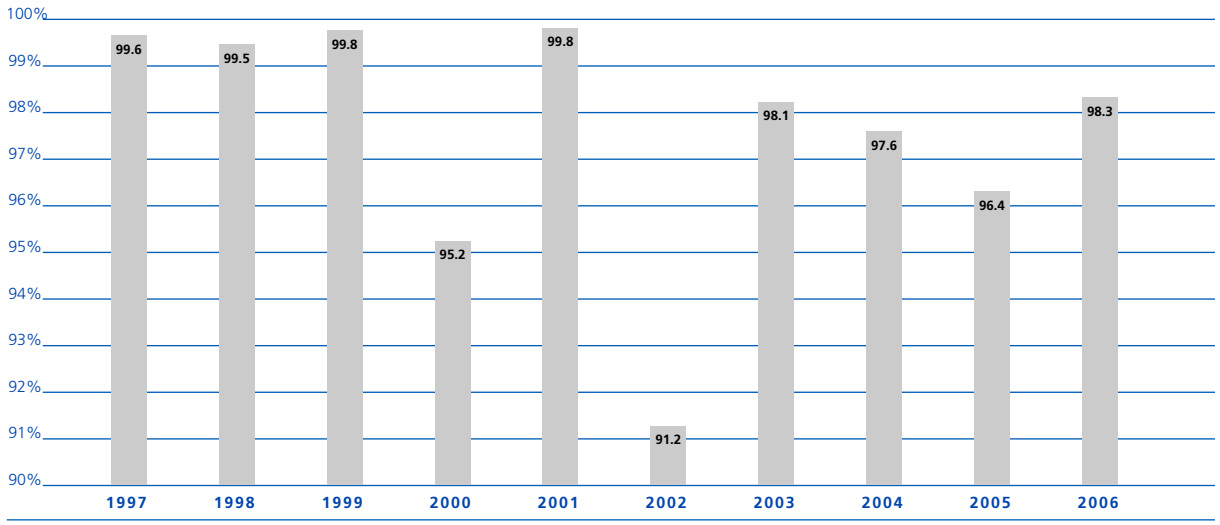
WHAT ARE THE HEALTH EFFECTS OF CONTAMINATED DRINKING WATER?

Drinking water contaminated with coliform bacteria may also be contaminated with pathogens that can cause an acute gastrointestinal illness. Public drinking water is tested for coliform bacteria regularly. If test results indicate that the water is contaminated, residents are advised to boil their water. Boiling water kills the pathogens that could potentially make people ill.

Lead found in older pipes, solders, and fixtures, from either public systems or private wells, can be a source of water contamination. Lead exposure through drinking water can contribute to childhood lead poisoning, which has a variety of health effects. Between September 2003 and July 2006, approximately 10% of children in Rhode Island with lead poisoning had elevated levels of lead in their drinking water.

Other drinking water contaminants may have different health effects. When public water sources are contaminated, the required public notification states the possible health effects.

PERCENT OF TIME PUBLIC WATER SYSTEMS ARE IN COMPLIANCE WITH RHODE ISLAND REQUIREMENTS



Data Source: Rhode Island Department of Health

HOW DOES CONTAMINATED DRINKING WATER RELATE TO THE PRINCIPLES OF HEALTHY HOUSING?

Public sources of drinking water are regulated fairly well. Private well water, on the other hand, is not subject to the same stringent regulations as public water. For both sources, the following two healthy housing principles pertain to drinking water:

- *Keep it free of contaminants* – Drinking water that is free of contaminants such as coliform bacteria, lead, and disinfection by-products, can prevent adverse health effects.
- *Keep it well-maintained* – Contamination of well water can result from poor well construction, improper maintenance, adverse use of the land at the surface of the well, the underlying geology of the land, and proximity to sources of contaminants. Maintaining private wells and public drinking water systems properly can avoid water contamination and help assure the quality of the drinking water.

NATIONAL AND LOCAL DATA

In Rhode Island there are 480 public water systems (and an estimated 10,000 private wells). Each year, the Rhode Island Department of Health evaluates how well public water systems meet minimum health standards. The indicator reflects the percent of time each year that all public water systems were in compliance with maximum contaminant levels and treatment technique requirements. Rhode Island water systems have been in compliance with requirements more than 90% of the time each year for the last ten years.

WHAT CAN YOU DO ABOUT CONTAMINATED DRINKING WATER?

Ensuring safe drinking water requires the maintenance of water systems and regular testing of water for contaminants. The medical and housing communities and the general public each have a responsibility for ensuring that the water people drink is safe. Specifically, the following actions should be taken by each stakeholder group:

Medical community

- Dentists should encourage private well owners to test for fluoride.
- Pediatricians and obstetricians should encourage private well owners to test for nitrate/nitrite and to follow other testing recommendations.

Housing community

- Encourage private well owners to follow the Rhode Island Department of Health's recommendations for the testing of private well water.
- Housing authorities should make water quality one of the housing quality standards that is checked prior to approval for Section 8 housing and federal loans or subsidies.

Household occupants

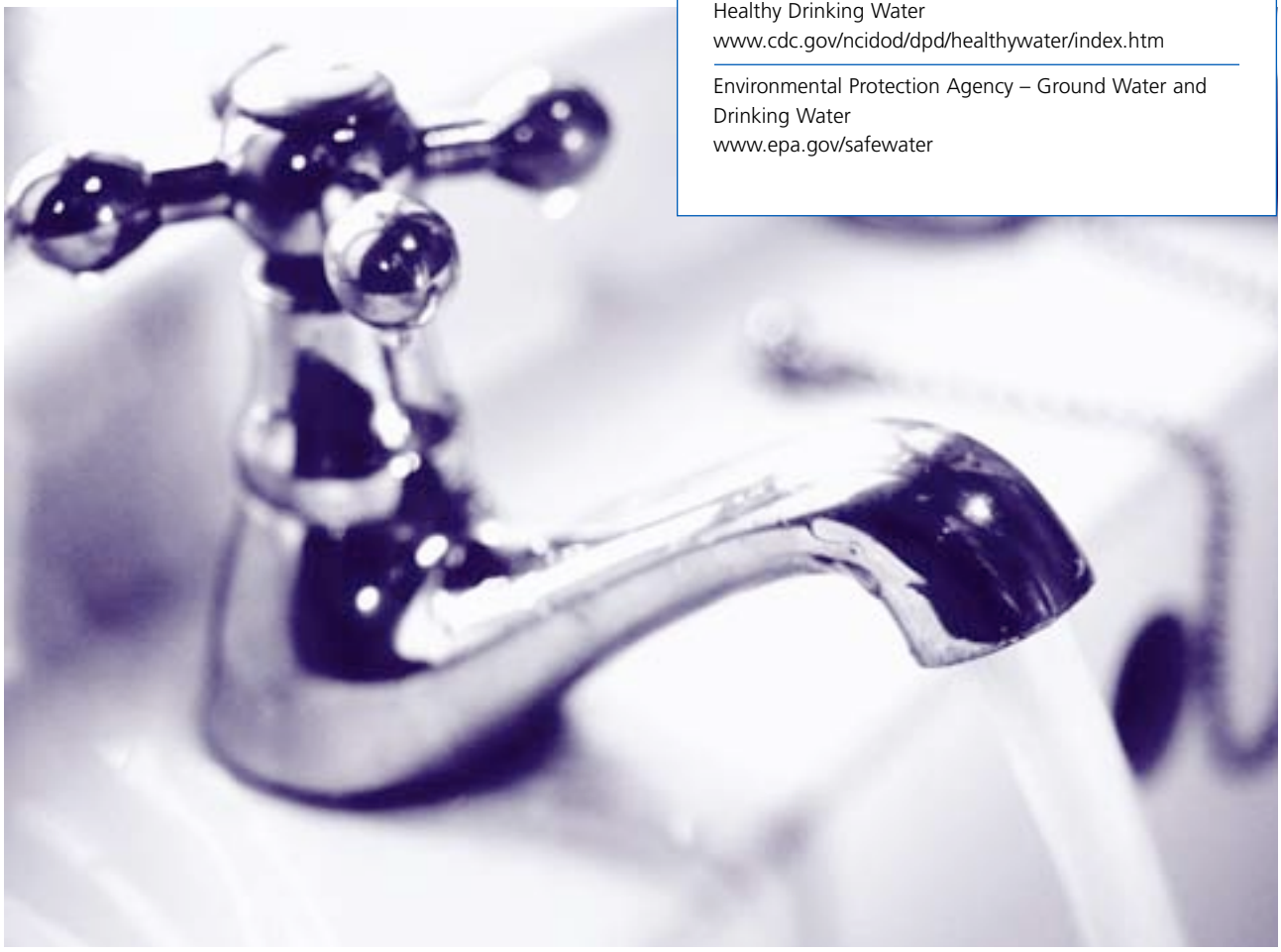
- Support efforts to protect and maintain the local water system and its source of supply.
- Maintain private wells and test private well water regularly.
- Pay special attention to public notices issued by the local water system.
- Flush cold-water taps before using water for drinking or cooking.
- Always make infant formula with cold water.

WEB RESOURCES

Rhode Island Department of Health – Drinking Water
www.health.ri.gov/topics/drinkingwater.php

Centers for Disease Control and Prevention – Healthy Drinking Water
www.cdc.gov/ncidod/dpd/healthywater/index.htm

Environmental Protection Agency – Ground Water and Drinking Water
www.epa.gov/safewater



LEAD

WHAT IS LEAD?

Lead is a naturally occurring soft metal that is found throughout the environment. It is commonly used in building construction, lead-acid batteries, bullets, and some solder. Prior to the 1970s lead was used in gasoline and in paint for residential properties. In the United States, the use of lead-based paint was discontinued in 1978. Housing built before this time is likely to contain lead, and therefore represents a potential hazard to humans. Lead is also found in some folk remedies and numerous consumer products, such as ceramic dishes, toys, soft vinyl plastics, electrical cords, and children's jewelry.

WHAT ARE THE HEALTH EFFECTS OF LEAD?

Children under the age of six are most susceptible to the health effects of lead. Pregnant women are also at risk because they can pass lead to their fetus. Low-level exposure to lead does not cause any symptoms, but can result in a number of health effects. Lead can result in cognitive problems such as decreased memory, lower IQ, learning disabilities, and physical problems, which include impaired coordination and muscle weakness. Lead is also associated with behavioral problems such as irritability, reduced attention span, mood changes, and increased risk of violent and criminal activity. At very high levels, lead poisoning can lead to coma and even death.

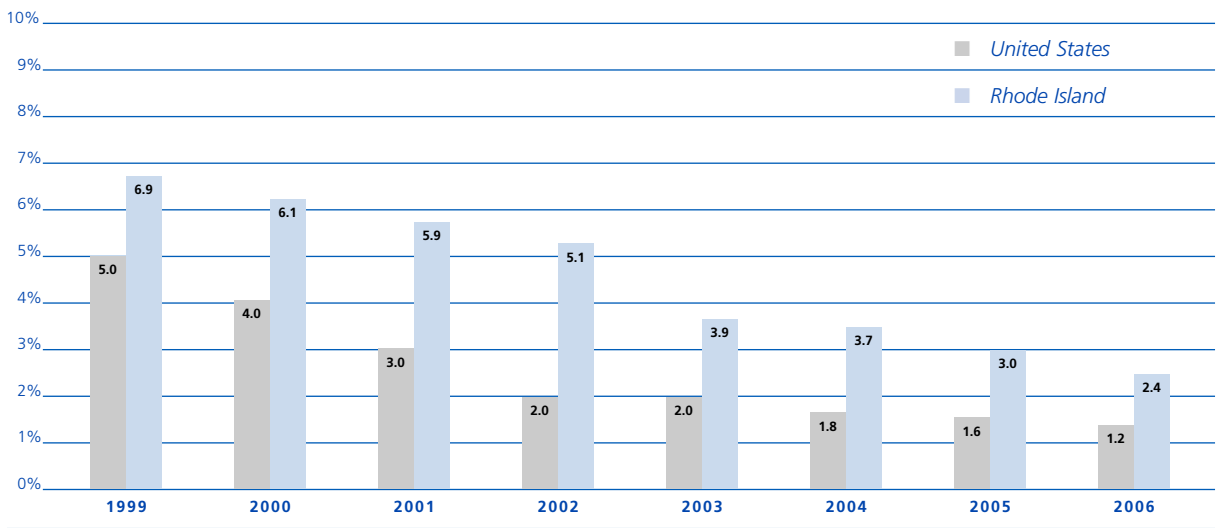
Efforts to reduce lead poisoning have been successful as a result of the medical and housing communities' efforts around screening and education.

HOW DOES LEAD RELATE TO THE PRINCIPLES OF HEALTHY HOUSING?

People living in homes built before 1978 should be aware of the sources of lead in their homes and take precautions to minimize their risks. The following four principles of healthy housing pertain to lead:

- *Keep it dry* – The major source of lead in the home is from chipping or peeling lead based paint (used prior to 1978). Moisture and leaks increase the likelihood that paint will peel and chip; therefore, it is important to address moisture problems so that paint remains intact.
- *Keep it clean* – When young children play on the floor and then put their hands and toys in their mouths, they often ingest lead dust. There are two main sources of lead dust in a home. Dust and dirt can be tracked in from outdoors, or, dust can result from chipping or peeling lead based paint indoors, especially on friction surfaces such as windows and doors. To minimize exposure to lead dust, it is important to clean regularly using a wet rag or mop, and/or use a vacuum with a high efficiency particulate air (HEPA) filter.
- *Keep it free of contaminants* – Lead is also found in some folk remedies and numerous consumer products, such as ceramic dishes, toys, and children's jewelry. It is important to be aware that certain products contain lead, and stay informed about recalls issued by the Consumer Product Safety Commission.

CONFIRMED ELEVATED BLOOD LEAD LEVELS AS PERCENT OF CHILDREN TESTED



Data Source: Centers for Disease Control and Prevention Website

- *Keep it well-maintained* – Keeping homes well-maintained, so it is free of chipping and peeling paint, is one of the best ways to minimize or eliminate exposure to lead.

NATIONAL AND LOCAL DATA

The percent of children with lead poisoning in the United States and Rhode Island has decreased significantly from 1999 to 2006. Despite this decrease, however, the rates of lead poisoning in Rhode Island have been consistently higher than the United States rates.

In 2007, 614 children in Rhode Island, or 1.9% of all children screened for lead, had a blood lead level ≥ 10 µg/dL. Of these 614 children, 388 were newly lead poisoned in 2007. Free environmental inspections of the home are offered to families of children who have a venous blood lead level ≥ 20 µg/dL or two venous blood lead levels between 15-19 µg/dL between 90 and 365 days apart. Over the last four years, 395 home inspections were performed. Lead hazards were found in 97.7% of the homes where an inspection was performed. This illustrates the importance of healthy housing with respect to protecting children from lead.

WHAT CAN YOU DO ABOUT LEAD?

Efforts to reduce lead poisoning have been successful as a result of the medical and housing communities' efforts around screening and education. As long as lead hazards exist, however, screening and educational efforts must remain strong. In addition, strategies should be developed to reach families who are not having their children screened. Specifically, each group of stakeholders should do the following:

Medical community

- Make sure that children under the age of six are screened for lead according to Rhode Island's Lead Screening and Referral Guidelines.
- Talk to parents about lead, and the potential sources of lead in homes.

- Refer parents to the HEALTH Information Line (1-800-942-7434) for more information on how to prevent lead poisoning.

Housing community

- Use lead safe work practices and talk to co-workers about the importance of using them.
- Comply with federal Pre-Renovation Education law by distributing the brochure titled, "Protect Your Family From Lead in Your Home," to owners and occupants before beginning renovations.
- Encourage all clients to comply with the Lead Hazard Mitigation Law (see the Rhode Island Housing Resources Commission website) and get a Certificate of Conformance if required.

Household occupants

- Seek education and training about lead safe work practices or hire a trained professional before performing renovations on a pre-1978 home.
- Vacuum with a high efficiency particulate air (HEPA) filter, dust with a wet rag, and mop regularly to minimize lead dust in the home.
- Repair or cover any chipping or peeling paint in the home.
- Clean windowsills and window wells with a wet cloth.
- Learn about tenants' rights and responsibilities under the Lead Hazard Mitigation Law (see the Rhode Island Housing Resources Commission website).
- View lists of properties with known lead hazards on the Rhode Island Department of Health's website before renting or buying a home.

WEB RESOURCES

Rhode Island Department of Health – Lead
www.health.ri.gov/lead

Rhode Island Housing Resources Commission – Lead
www.hrc.ri.gov/misc/lead_mitigation.php

Centers for Disease Control and Prevention – Lead
www.cdc.gov/lead

Environmental Protection Agency – Lead
www.epa.gov/lead

Housing and Urban Development – Lead
www.hud.gov/offices/lead/index.cfm

MOLD

WHAT IS MOLD?

Molds are living organisms that help to break down dead organic materials. Mold is found everywhere: indoors, on many surfaces, and outdoors, on plants, leaves and in the soil. Mold spores travel through air. Once mold lands on a surface, it can grow as long as there is the right mix of moisture and food. Mold growth can look like spots, in many different colors, and can smell musty. Mildew is a term often used for mold that has a musty odor.

Due to the fact that mold is a naturally occurring organism that is everywhere in the environment, eliminating it completely is not an option. The key with mold is to be aware of its impact on health and how to limit its growth.

WHAT ARE THE HEALTH EFFECTS OF MOLD?

Contact with mold happens every day, usually by touching, eating, or breathing it. Exposure to mold and mold spores can trigger allergic reactions such as watery eyes, runny nose, sneezing, itching, coughing, wheezing, headache, and fatigue. Mold affects everyone differently. Some are more sensitive to molds than others, such as:

- Infants and children
- The elderly
- People with weak immune systems, such as those with HIV infection, cancer, or those who are undergoing chemotherapy
- People with chronic respiratory illnesses or respiratory conditions such as allergies and asthma

Anyone with a chronic respiratory illness or a weak immune system should be especially careful to avoid exposure to mold, especially exposures that could occur from cleaning surfaces contaminated with mold.

Under certain conditions some molds, such as Stachybotrys and Aspergillus, can produce toxins called mycotoxins. Mycotoxins caught the attention of the public because they can cause serious illness, but since all molds can cause health symptoms, any mold contamination needs to be treated seriously and handled with caution during cleanup.

HOW DOES MOLD RELATE TO THE PRINCIPLES OF HEALTHY HOUSING?

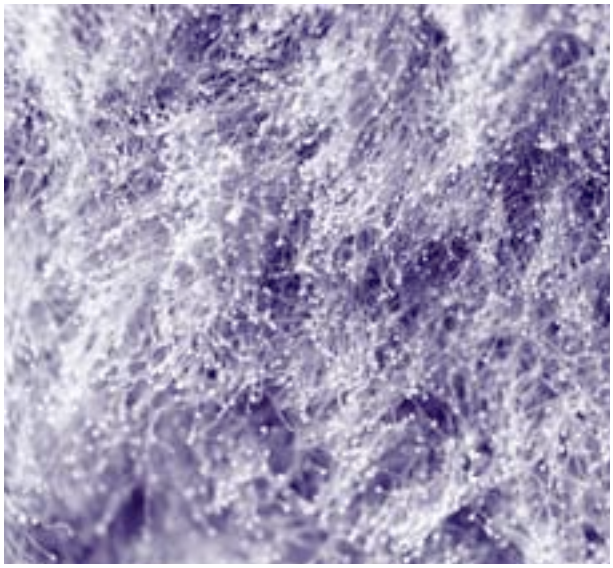
Molds require moisture and a food source to grow. There are several sources of moisture in a home that can cause molds to develop such as flooding, a damp basement or crawlspace, roof leaks, faulty plumbing, insufficient ventilation, and improperly vented clothes dryer. A wide variety of materials will support mold growth, including paper, wood, leather, fabrics, and even clothing. Molds grow best at moderate to warm temperatures, but will even multiply at refrigeration temperatures. The following principle of healthy housing pertains to mold:

Keep it dry

- Quickly dry out materials that have become wet, as mold will begin to grow within 24 to 48 hours.
- As soon as moisture is detected – either by sight or smell – work to eliminate it. Water damage, moisture or a musty smell signals that mold is most likely present. Sampling for molds is usually not necessary and there are no Federal or State standards or limits for mold. Mold can be hidden behind walls or above ceilings and may not be easy to locate. It is also important to inspect heating and/or air conditioning ducts to determine if there is mold growing inside.
- Once the source of moisture has been eliminated, the area where mold was growing should be cleaned. Unfortunately, porous surfaces such as upholstered furniture, carpets, ceiling tiles, drywall and paper products often cannot be completely cleaned and must therefore be discarded. Non-porous surfaces can be cleaned and do not need to be discarded. An all-purpose detergent is usually sufficient to clean mold. Use of bleach or fungicides is typically not recommended, as they may be irritants. However, if the water damage was caused by sewage contaminated flooding, disinfection should be performed. If the area to be cleaned is less than ten square feet in size, homeowners are capable of completing the job themselves. Simple precautions to take to prevent contact with and exposure to mold include wearing rubber gloves, eye protection and an N-95 respirator. Thorough cleaning with a stiff brush should remove the mold. The item must then be rinsed with clean water and completely dried. If the area of mold growth is larger than ten square feet, the services of a professional should be sought. Confirm that the source of moisture has been eliminated. Anyone with a chronic respiratory illness or a weak immune system should not clean up mold.

NATIONAL AND LOCAL DATA

There is no standard level for mold in Rhode Island. Typically, outdoor levels of mold vary with the season. Common types of mold include Penicillium, Aspergillus, and Cladosporium. In winter, mold can be found in samples at trace levels, i.e., a few colony forming units per cubic meter of air. During humid summer weather, levels can be hundreds of times higher. In healthy homes, the types and levels of mold found in the indoor air will be similar to levels outdoors. Due to the ubiquitous nature of mold, and the lack of regulatory oversight, no data on mold are available.



WHAT CAN YOU DO ABOUT MOLD?

Due to the fact that mold is a naturally occurring organism that is everywhere in the environment, eliminating it completely is not an option. The key with mold is to be aware of its impact on health and how to limit its growth. The following steps, if taken by each group of stakeholders below, will help to keep mold at bay and people healthy:

Medical community

- Consider mold as a possible cause when patients present with respiratory and/or allergic symptoms.
- Ask respiratory patients if their homes have signs of mold or moisture problems, such as condensation on windows, a musty odor, or water stains on the ceilings or walls.
- Educate patients with compromised immune systems and high sensitivity to allergens about mold and how to limit its growth in the household.

Housing community

- When building houses, take simple precautions to minimize moisture build up, such as installing ventilation to the outside in high moisture areas, vapor barriers in crawl spaces, and dehumidifiers in damp areas such as basements. Other precautions include insulating cold water pipes to reduce condensation and using mold resistant paints in high humidity areas.
- Routinely inspect houses for sources of moisture and take steps to dry out moist areas.
- Promptly respond to reports of water infiltration or mold growth.

Household occupants

- Become educated on the causes of mold, its health effects, and how to take proper precautions in the home.
- Assess high moisture areas in the home and consider taking precautionary steps such as installing ventilation to the outside in high moisture areas, vapor barriers in crawl spaces, and dehumidifiers in damp areas such as basements. Other precautions include insulating cold water pipes to reduce condensation and using mold resistant paints in high humidity areas.
- Thoroughly dry out flooded areas within 24 to 48 hours of the event.
- Promptly repair faulty plumbing, roof leaks, or any other causes of moisture.
- Seek professional assistance to handle significant mold problems such as growth covering an area larger than ten square feet in size.

WEB RESOURCES

Rhode Island Department of Health – Mold
www.health.ri.gov/environment/risk/Mold.pdf

Centers for Disease Control and Prevention – Mold
www.cdc.gov/mold/dampness_facts.htm

Environmental Protection Agency – Mold
www.epa.gov/mold/moldresources.html

Environmental Protection Agency –
Mold Remediation
www.epa.gov/mold/mold_remediation.html

RADON

WHAT IS RADON?

Radon is an invisible, odorless, tasteless, radioactive gas that can cause lung cancer. It comes from the natural decay of uranium that is found in the soil. The gas seeps into homes and buildings through cracks and openings in the basement floor or building foundation at levels that can be dangerous. Radon gas can also dissolve in ground water, diffusing into the home as well water is utilized.

High radon levels inside the home can be detrimental to people's health. The only way to determine if radon is present in a home is by administering an easy-to-use radon test in the lowest living space in the home, such as a finished basement. Test kits are inexpensive and widely available. If the test result is greater than or equal to 4.0 picoCuries per liter (pCi/L), the Environmental Protection Agency recommends taking action to reduce radon in the home.

WHAT ARE THE HEALTH EFFECTS OF RADON?

Radon is estimated to cause approximately 21,000 deaths a year nationally. Radon is a serious environmental health problem that can cause lung cancer. Exposure to elevated levels of indoor radon gas is second only to cigarette smoking as a cause of lung cancer in the United States. Individuals who are exposed to elevated radon levels and also smoke, are at an increased risk of developing lung cancer. The threat posed by elevated radon is completely preventable.

The threat posed by elevated radon is completely preventable. Test properties for radon regularly.

HOW DOES RADON RELATE TO THE PRINCIPLES OF HEALTHY HOUSING?

Radon can pose great health risks at high levels. The following principle of healthy housing pertains to radon:

Keep it free of contaminants

- Test the home for radon – Radon tests are inexpensive, widely available, and easy to use. There are two types of tests: a short-term radon screening test (2-4 days) or a long-term test device (90-365 days). Due to natural variations in radon levels, a short-term test may not accurately reflect the true risk. A long-term radon test will provide a better indication of the year-round radon level in the home. If there is an elevated radon level in a home with a well, the well water should also be tested for radon.
- Take steps to eliminate radon from the home – There are several proven methods of reducing radon gas levels in a home. The most common method is called sub-slab depressurization. In this method a pipe is penetrated through the basement floor to forcibly vent the radon gas outside above the roofline. The cost of sub-slab depressurization is comparable to other home improvement projects such as roof replacement or exterior repainting.
- Radon Resistant New Construction is another radon mitigation technique that is available if you are building a new home. Radon Resistant New Construction involves installing a passive radon system during construction of a home, which is significantly less expensive than installing a system later.

NATIONAL AND LOCAL DATA

In the United States, one in fifteen homes is found to contain radon levels above the EPA's action level of 4.0 picoCuries per liter. In Rhode Island, approximately one in four homes contains radon above this action level.

Extensive mapping of test results in Rhode Island revealed the highest percentage of elevated radon levels in Washington and Kent County. (To see the map, please visit the website www.health.ri.gov/environment/occupational/radon/Radon2007-2008.pdf). *In some towns, more than fifty percent of the homes tested exceed the EPA action level.* However, the concentration of radon gas in any individual home cannot be predicted from the mapping or from the result of a neighboring home. Elevated levels have been identified in all communities in the state and often vary significantly in adjacent homes. The age of the home is also not an indicator of what the radon level will be. In fact, newer homes are often found to have high radon concentrations because the construction is more airtight.

WHAT CAN YOU DO ABOUT RADON?

Efforts to reduce radon levels in the home require some simple precautionary measures. Specifically, each group of stakeholders should do the following:

Medical community

- Educate patients about the effects of radon exposure and promote radon testing in homes.
- Group the message of the synergistic effect of smoking and radon exposure.
- Support legislative initiatives for radon testing and mitigation.

Housing community

- Test properties for radon regularly.
- Install radon mitigation systems when elevated radon levels are identified.
- Consider using Radon Resistant New Construction techniques in new construction.

Household occupants

- Become educated on the risks of radon.
- Test your home, or ask your landlord to test your home for radon.
- If your home has elevated levels of radon, install a radon mitigation system.
- Consider Radon Resistant New Construction techniques when adding to or building a house.

WEB RESOURCES

Rhode Island Department of Health – Radon
www.health.ri.gov/environment/occupational/radon/index.php

Environmental Protection Agency – Radon
www.epa.gov/radon/index.html

National Safety Council – Radon
www.nsc.org/issues/radon

American Cancer Society – Radon
www.cancer.org/docroot/PED/content/PED_1_3x_Radon.asp

UNINTENTIONAL INJURIES

Most unintentional injuries occur in or near the home. Simple precautionary measures can prevent them.

WHAT ARE UNINTENTIONAL INJURIES?

Unintentional injuries are defined as any physical damage to the body resulting from unplanned events. Most unintentional injuries occur in or near the home, and can easily be prevented. Successful injury prevention policies prevent injuries and can improve well-being. For example, installing smoke detectors reduces the number of fire-related injuries and using products with childproof caps reduces the number of poisonings from ingestion of household products.

WHAT ARE THE HEALTH EFFECTS OF UNINTENTIONAL INJURIES?

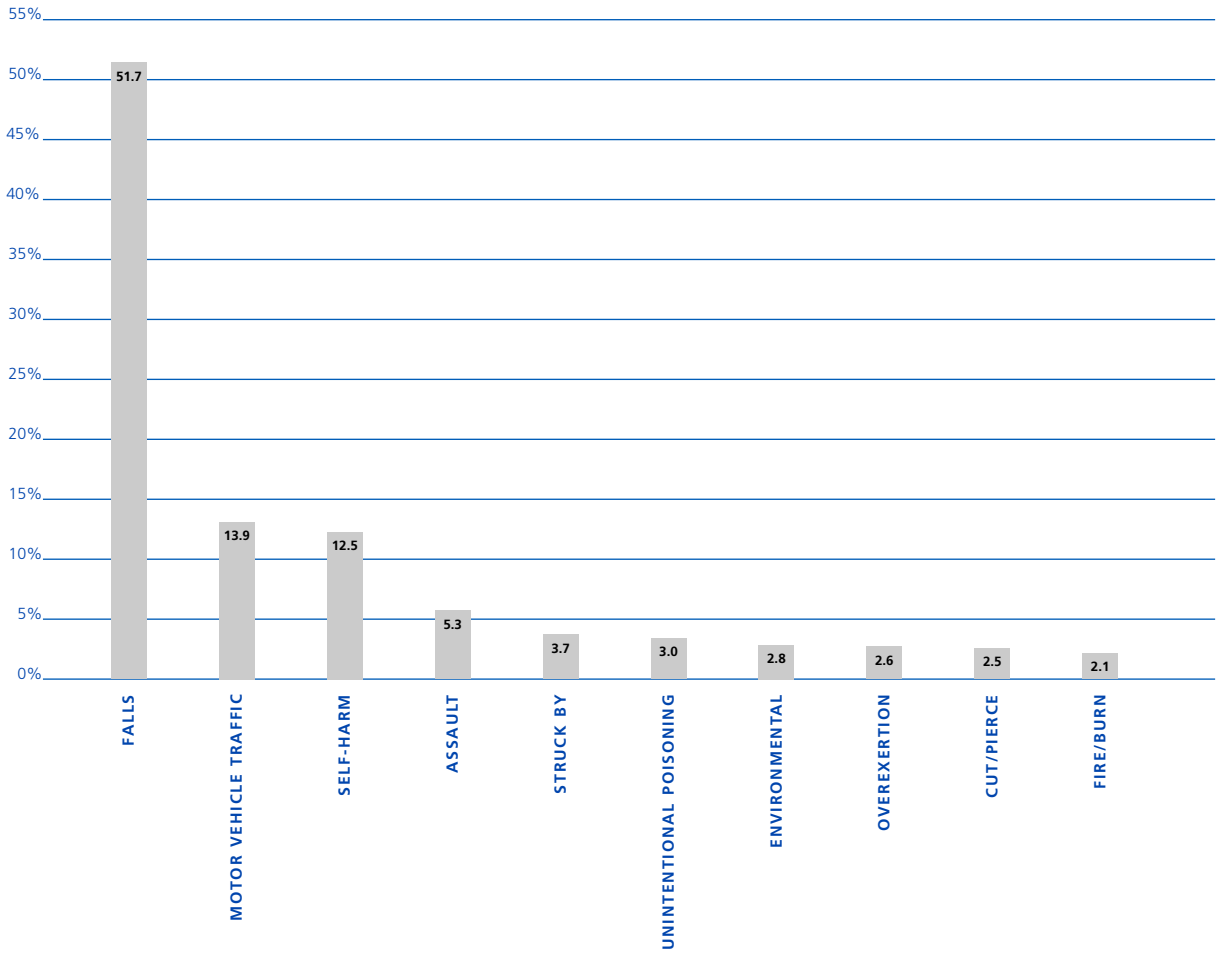
Unintentional injuries are the major cause of death in people between 1 and 44 years of age. Falls account for the majority of unintentional injuries reported at hospital emergency departments across almost all age groups.

HOW DO UNINTENTIONAL INJURIES RELATE TO THE PRINCIPLES OF HEALTHY HOUSING?

Unintentional injuries are easy to prevent by taking simple precautions such as implementing the following two principles of healthy housing:

- *Keep it free of contaminants* – Keeping a home free of contaminants can minimize unintentional injuries due to poisonings. Properly storing hazardous products such as household cleaners and medications, and keeping them out of reach of children, will reduce the potential for unintentional injuries due to poisoning.
- *Keep it well-maintained* – Trip and fall hazards are another common cause of unintentional household injuries. Keeping a home well-maintained by ensuring that floors are clear, steps are intact, railings are secure, and lighting is sufficient, will reduce the risk of injury from trips and falls.

TOP 10 LEADING CAUSES OF INJURY-RELATED HOSPITALIZATION, RHODE ISLAND, 1999-2003 (N=22,497)



Data Source: Rhode Island Hospital Discharge Data, Rhode Island Department of Health, Center for Health Data and Analysis

LEADING CAUSES OF DEATH, RHODE ISLAND, STATISTICS BY AGE, 1999–2003

RANK	AGE GROUPS											
	<1	1-4	5-9	10-14	15-19	20-24	25-34	35-44	45-54	55-64	65+	ALL AGES
1	Short Gestation 111	Unintentional Injury 12	Malignant Neoplasms 15	Unintentional Injury 14	Unintentional Injury 71	Unintentional Injury 84	Unintentional Injury 133	Malignant Neoplasms 338	Malignant Neoplasms 913	Malignant Neoplasms 1,660	Heart Disease 13,430	Heart Disease 15,319
2	Congenital Anomalies 63	Congenital Anomalies 7	Unintentional Injury 14	Malignant Neoplasms 10	Homicide 31	Suicide 34	Suicide 73	Heart Disease 227	Heart Disease 561	Heart Disease 1,023	Malignant Neoplasms 8,994	Malignant Neoplasms 12,026
3	Placenta Cord Membranes 29	Malignant Neoplasms 7	Homicide 4	Homicide 2	Suicide 20	Homicide 34	Malignant Neoplasms 63	Unintentional Injury 163	Unintentional Injury 126	Chronic Low. Respiratory Disease 175	Cerebro-vascular 2,754	Cerebro-vascular 2,994
4	Maternal Pregnancy Comp. 21	Heart Disease 4	Septicemia 3	Suicide 2	Malignant Neoplasms 10	Malignant Neoplasms 14	Homicide 44	Suicide 113	Liver Disease 119	Diabetes Mellitus 149	Chronic Low Respiratory Disease 2,261	Chronic Low Respiratory Disease 2,522
5	SIDS 18	Cerebro-vascular 3	Chronic Lower Respiratory Disease 2	Influenza & Pneumonia 2	Congenital Anomalies 9	Heart Disease 13	Heart Disease 40	Liver Disease 68	Suicide 96	Liver Disease 127	Influenza & Pneumonia 1,422	Influenza & Pneumonia 1,523
6	Bacterial Sepsis 14	Homicide 3	Congenital Anomalies 2	Benign Neoplasms 2	Heart Disease 3	Congenital Anomalies 3	HIV 17	HIV 66	Diabetes Mellitus 78	Cerebro-vascular 120	Alzheimer's Disease 1,268	Unintentional Injury 1,441
7	Circulatory System Disease 14	Benign Neoplasms 2	Five Tied 1	Congenital Anomalies 2	Meningo-coccal Infection 2	Cerebro-vascular 2	Cerebro-Vascular 9	Cerebro-Vascular 42	Chronic Low. Respiratory Disease 63	Unintentional Injury 91	Diabetes Mellitus 1,049	Diabetes Mellitus 1,308
8	Unintentional Injury 13	Influenza & Pneumonia 2	Heart Disease 1	Heart Disease 1	Five Tied 1	Chronic Lower Respiratory Disease 2	Influenza & Pneumonia 8	Homicide 37	Cerebro-Vascular 62	Influenza & Pneumonia 47	Unintentional Injury 718	Alzheimer's Disease 1,279

Data Source: National Center for Health Statistics (NCHS), National Vital Statistics System

NATIONAL AND LOCAL DATA

Falls, a type of unintentional injury, are a major cause of hospitalizations, especially for those over the age of 85. Falls are the leading cause of unintentional deaths among older adults (65 and older). The Rhode Island statistics presented on the next page are similar to national statistics.

WHAT CAN YOU DO ABOUT UNINTENTIONAL INJURIES?

Preventing unintentional injuries in the home requires that occupants take some simple precautionary measures. Once those measures are in place, occupants only need to maintain the measures in good working condition and keep the house clear of clutter. Specifically, each stakeholder group below should take the following steps:

Medical community

- Know the major injury risks for the populations you serve.
- Educate your patients about potential risks for injury in the home.
- Refer patients with housing risk issues to agencies that can assist them with mitigation.

Housing community

- Ensure that all construction is completed safely.
- Clean up all building materials before leaving a job site.
- Encourage clients to install smoke and carbon monoxide detectors.

Household occupants

- Never smoke inside the house.
- Ensure that there is a smoke detector outside of every bedroom.
- Maintain smoke detectors by testing them monthly and changing batteries every six months.
- Install carbon monoxide detectors.
- Unload guns and store them in a secure location.
- Prevent falls by using nightlights throughout the home.
- Keep all rooms clutter-free.
- Make sure that all carpets and area rugs have slip-proof backing or are tacked to the floor, including carpeting on stairs.
- Keep electrical cords and telephone lines out of walkways.
- Be sure that all stairways are well lit and that stairs have handrails on both sides.
- Use a rubber bath mat in the shower or tub.
- Do not use food containers (e.g., soda bottles) as storage containers for cleaning supplies or medicine.
- Keep all medicines in a locked cabinet or on a high shelf.
- Clean out your medicine cabinet yearly (when you roll back your clock).

WEB RESOURCES

Rhode Island Department of Health – Safe RI
www.health.ri.gov/disease/saferi/index.php

Centers for Disease Control and Prevention – Injury Center
www.cdc.gov/ncipc/default.htm

Rhode Island Hospital – Injury Prevention Center
www.lifespan.org/rih/services/ipc/

National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)
www.niams.nih.gov/Health_Info/Bone/Osteoporosis/Fracture/default.asp

Regional Center for Poison and Control Serving Massachusetts and Rhode Island (1-800-222-1222)
www.maripoisoncenter.com

The State of Home Safety in America
Facts About Unintentional Injuries in the Home
www.homesafetycouncil.org/state_of_home_safety/sohs_2004_p017.pdf

National Council on Aging
www.healthyagingprograms.org

APPENDIX A: COMMON HEALTH HAZARDS MATRIX

HAZARD	SOURCE OF HAZARD	POSSIBLE HEALTH EFFECTS
ASBESTOS	Once used for boiler/pipe insulation, in tile and siding materials, fireproofing material	Cancer of the lung and lining of the lung (mesothelioma), irreversible lung scarring (asbestosis)
CARBON MONOXIDE	Odorless gas from burned fuel in furnaces, stoves, unvented heaters and other appliances	Dizziness, headaches, nausea, confusion, disorientation, coma, death
COCKROACHES	Moisture, improper storage of food, holes in structure that is low to the ground	Trigger asthma attacks
DUST MITES	Beds, pillows, furniture, carpets, and on stuffed toys; moisture from poor ventilation	Trigger asthma attacks; helps develop asthma; causes hay fever
LEAD PAINT	Lead-pigments found in paints and coatings in housing built before 1978 and especially if built before 1950.	Coma, convulsions, and death; effects nervous system, hematopoietic system and kidneys; learning disabilities, reduced concentration and attentiveness and behavior problem; decreased hearing acuity; hyperactivity. There is presently no known safe level of lead for a developing child.
MOLD	Areas of poor ventilation; moisture from showers; water-saturated cellulose products (e.g. insulation and ceiling tile)	Trigger asthma attacks, allergies, skin rashes, fatigue, dizziness, nausea, flu symptoms, fungal infections, respiratory and eye irritation, fever, digestive problems, coughing
PESTICIDES	Chemicals applied in apartment and/or on lawns; children may track pesticides indoors if they walk through areas treated with pesticides	Dizziness, headaches, vomiting, sweating, fatigue, respiratory and eye irritation; increased risk of cancer and birth defects; learning, developmental, and behavioral problems; trigger asthma attacks.
RADON	Odorless radioactive gas that moves through soil into buildings through cracks in foundation and pipes	Increases risk of lung cancer
RODENTS	Gaps or holes in building and apartment; mice can get through a hole as small as a nickel and rats as small as a half dollar	Trigger asthma attacks; increase asthma symptoms; produce allergic reactions and diseases such as hantavirus and lymphocytic choriomeningitis virus

CORRECTIVE ACTION NEEDED
Maintenance or removal by a licensed company
Keep carbon monoxide detectors in working order; properly vent furnaces and appliances; regularly maintain furnace. Fire Companies can check carbon monoxide levels
Properly seal foods; plenty of ventilation; clean food surfaces; seal holes or cracks; place trash in sealed containers; use cockroach bait. Ask doctor about asthma and asthma triggers.
Eliminate moisture sources; regularly clean bedding with hot water; wash stuffed toys; vacuum and steam rugs; pull up old rugs use mattress covers. Ask doctor about asthma and asthma triggers.
Find out if the dwelling contains lead based paints, and properly remove lead hazards; properly cover/dispose of peeling or chipping paint; ensure constant vigilance of lead hazards and lead dust; have children under six years of age tested annually; use filtered water; cover lead-contaminated soil with clean soil, grass, mulch, gravel, etc. Ask doctor about lead and lead poisoning.
Eliminate moisture sources; clean and dry out flooded areas as soon as possible; call professional mold remediation company
Use less toxic pesticides; eliminate food and water sources consumed by pests; use trapping (e.g. mouse traps); regularly clean apartment; place trash in sealed containers
Test for radon gas, may require special radon removal system to be installed.
Integrated pest management: seal off holes and areas where rodents enter building; set traps; place trash in sealed containers; minimize access to food and shelter; use less-toxic pesticides

RESOURCES

Other hazards, such as domestic waste, bed bugs, mercury in thermometers, noise, drowning, and volatile organic compounds will be included in this matrix in the future, and will be posted online and/or in our next edition. For suggestions on other health hazards to include in the future, please contact Daniela Quilliam, MPH, daniela.quilliam@health.ri.gov.

The following resources also have information on other health hazards, as well as those listed in this edition:

Rhode Island Department of Health
www.health.ri.gov

Regional Center for Poison Control and Prevention
www.maripoisoncenter.org

Centers for Disease Control and Prevention (CDC)
www.cdc.gov

Environmental Protection Agency (EPA)
www.epa.gov

Housing and Urban Development (HUD)
www.hud.gov

National Center for Healthy Housing (NCHH)
www.centerforhealthyhousing.org

APPENDIX B: CONTACT INFORMATION

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UNINTENTIONAL INJURY

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RHODE ISLAND DEPARTMENT OF HEALTH HEALTHY HOUSING STEERING COMMITTEE

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